CLAIMS

1. A 2-dimensional code region extraction method for extracting a region in which a 2-dimensional code exists, the method comprising the steps of:

scanning image data containing a 2-dimensional code vertically and horizontally;

determining the white/black gradation of scanned pixels, and detecting at least two blank space portions each consisting of a sequence of white pixels exceeding a predetermined number of pixels;

calculating the length and central coordinates of a non-blank space portion that exists between the detected blank space portions; and

comparing the lengths of the non-blank space portions that exist in the vertical and horizontal directions and their central coordinates respectively so as to determine the presence of a 2-dimensional code, and detecting a 2-dimensional code candidate region.

2. The 2-dimensional code region extraction method according to claim 1, wherein the step of detecting a 2-dimensional code candidate region comprises detecting a plurality of 2-dimensional code candidate regions, comparing them, and then ranking them.

3. The 2-dimensional code region extraction method according to claim 1, wherein the blank space portion detecting step comprises detecting a blank space portion that exists around the 2-dimensional code.

4. The 2-dimensional code region extraction method according to claim 1, wherein the scanning step comprises scanning the image data at regular intervals.

5. The 2-dimensional code region extraction method according to claim 4, wherein the regular interval is not greater than one half of the length of one of the sides of which a

2-dimensional code of a minimum possible size on the image data is composed.

6. A 2-dimensional code region extraction device comprising:

scan means for scanning image data containing a 2-dimensional code vertically and horizontally;

blank space portion detection means for determining the white/black gradation of scanned pixels and detecting at least two blank space portions each consisting of a sequence of white pixels exceeding a predetermined number of pixels;

non-blank space portion calculation means for calculating the length and central coordinates of a non-blank space portion that exists between the detected blank space portions; and

2-dimensional code candidate region extraction means for comparing the lengths and central coordinates of the non-blank space portions that exist in the vertical and horizontal directions, respectively so as to determine the presence of a 2-dimensional code, and detecting a 2-dimensional code candidate region.

7. The 2-dimensional code region extraction device according to claim 6, further comprising rank determination means for comparing a plurality of 2-dimensional code candidate regions detected by said 2-dimensional candidate region extraction means, and ranking them.

8. An electronic device capable of reading a 2-dimensional bar code symbol, comprising the 2-dimensional code region extraction device according to claim 6 or 7.

9. A program for causing a computer to carry out the steps of:

scanning image data containing a 2-dimensional code vertically and horizontally;

determining the white/black gradation of scanned pixels, and detecting at least two blank space portions each consisting of a sequence of white pixels exceeding a

predetermined number of pixels;

calculating the length and central coordinates of a non-blank space portion that exists between the detected blank space portions; and

comparing the lengths and central coordinates of the non-blank space portions that exist in the vertical and horizontal directions, respectively so as to determine the presence of a 2-dimensional code, and detecting a 2-dimensional code candidate region.

10. A computer-readable recording medium in which a program is recorded, the program causing a computer to carry out the steps of:

scanning image data containing a 2-dimensional code vertically and horizontally;

determining the white/black gradation of scanned pixels, and detecting at least two blank space portions each consisting of a sequence of white pixels exceeding a predetermined number of pixels;

calculating the length and central coordinates of a non-blank space portion that exists between the detected blank space portions; and

comparing the lengths and central coordinates of the non-blank space portions that exist in the vertical and horizontal directions so as to determine the presence of a 2-dimensional code, and detecting a 2-dimensional code candidate region.